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Dugan et al.

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[54] **OPTICAL CHANNEL REGULATOR AND METHOD**

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[58] Field of Search 359/110, 124, 359/127, 161, 187; 385/140

[56] **References Cited**

U.S. PATENT DOCUMENTS

5,392,154	2/1995	Chang et al.	359/341
5,557,439	9/1996	Alexander et al.	359/130
5,815,299	9/1998	Bayart et al.	359/124

FOREIGN PATENT DOCUMENTS

0637148A1	7/1994	European Pat. Off.	H04B 10/17
0762677A2	8/1997	European Pat. Off.	H04B 10/145
2294170	7/1995	United Kingdom	H04B 10/17

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[57] **ABSTRACT**

An optical channel regulator (46) is provided. The optical channel regulator (46) includes a tapped optical coupler (60) receiving an optical line carrying an optical signal. The tapped optical coupler (60) provides substantially all of the optical signal as an output. An electrically variable optical attenuator (64) receives the output of the tapped optical coupler (60) and attenuates the optical signal responsive to a feedback control signal. A second tapped optical coupler (66) receives an output of the attenuator (64). The second coupler (66) provides substantially all of the received optical signal as an output and provides a remaining portion of the optical signal as a tapped output. An optical detector (68) then receives the tapped output and provides an output signal representing the optical signal. A comparator (70) receives the output signal of the optical detector (68) and a reference signal. The comparator (70) compares the output signal and the reference signal and provides the feedback control signal to the attenuator (64) responsive to the comparison. As part of a multi-channel communication system, the regulator is used to adjust the levels of each channel for automatically maintaining channel balance and equalization.

8 Claims, 3 Drawing Sheets